

CLAIMS

1. An image sensor test apparatus bringing input and output terminals of image sensors into contact with contact parts of a test head, emitting light on light receiving surfaces of said image sensors, and inputting and outputting electrical signals with respect to input and output terminals of said image sensors from said test head so as to test at least one image sensor for optical characteristics,

said image sensor test apparatus provided with at least
a contact arm holding said image sensor and bringing the image sensor into contact with a contact part of the test head,

a moving means provided at a base side and moving said contact arm,

a light source emitting light to the light receiving surface of said image sensor,

a calculating means for calculating a relative amount of deviation of an optical axis of the light receiving surface of the image sensor to an optical axis of said light source, and

a correcting means for correcting the position of said contact arm in the state holding said image sensor based on the relative amount of deviation of the optical axis of said image sensor calculated by said calculating means.

2. An image sensor test apparatus as set forth in claim 1, further provided with

a first image capturing means for capturing an image of an image sensor in the state held at said contact arm from said light receiving surface side and

an image processing means for recognizing the relative position of said image sensor in the state held at said contact arm with respect to said contact part based on image information captured by said first image capturing means,

said correcting means provided at said base side and correcting the position of said contact arm in the state holding said image sensor based on the relative amount of deviation of the optical axis of said image sensor calculated by said calculating means and the relative position of said image sensor recognized by said image processing means.

3. An image sensor test apparatus as set forth in claim 1 or 2, wherein said calculating means calculates said relative amount of deviation of the optical axis of the image sensor with respect to the optical axis of the light source based on the electrical signals outputted from the input and output terminals of said image sensor with respect to the contact part of said test head while emitting light from said light source toward the light receiving surface of said image sensor in the state contacting said contact part.

4. An image sensor test apparatus as set forth in claim 2 or 3, wherein said image processing means recognize the relative position of said image sensor with respect to said contact part based on a chip of said image sensor in the image information captured by said first image capturing means.

5. An image sensor test apparatus as set forth in claim 2 or 3, wherein said image processing means recognizes the relative position of said image sensor with respect to said contact part based on input and output terminals of said image sensor in the image information captured by said first image capturing means.

6. An image sensor test apparatus as set forth in any one of claims 2 to 5, wherein

the apparatus is further provided with a transparent carrying surface on which said image sensor is carried,

said contact arm has an upper contact for electrically connecting the input and output terminals led out to the surface of said image sensor opposite to the light receiving surface to said contact part, and

said carrying surface is movable to any position in an X-Y plane

substantially parallel to said contact part.

7. An image sensor test apparatus as set forth in any one of claims 2 to 6, wherein

the apparatus is further provided with a second image capturing means for capturing an image of said contact part, and

said image processing means recognizes the relative position of said image sensor in the state held at said contact arm with respect to said contact part based on image information captured by said first image capturing means and said second image capturing means.

8. An image sensor test apparatus as set forth in any one of claims 1 to 7, wherein each contact arm is provided with a holding side arm holding said image sensor, a root side arm fixed to said moving means, and a lock-and-free means provided between said holding side and said root side arms and able to lock or free planar movement of said holding side arm with respect to said root side arm in an X-Y plane substantially parallel to said contact part.

9. An image sensor test apparatus as set forth in claim 8, wherein each contact arm is further provided with a tilting means able to rotate said image sensor about any axis parallel to said X-Y plane.

10. An image sensor test apparatus as set forth in claim 8 or 9, wherein said correcting means has drive units moving said holding side arm freed by said lock-and-free means to any position in said X-Y plane.

11. An image sensor test apparatus as set forth in claim 10, wherein said drive units include a first drive unit moving said holding side arm in the X-axial direction in said X-Y plane, a second drive unit moving said holding side arm in the Y-axial direction, and a third drive unit rotating said holding side arm about any point within said X-Y plane.

12. An image sensor test apparatus as set forth in claim 10 or 11, wherein said carrying surface moves in said X-Y plane by the drive unit provided in said correcting means.

13. An image sensor test apparatus as set forth in any one of claims 8 to 12, wherein each holding side arm has one or more abutting members contacting said correcting means.

14. An image sensor test apparatus as set forth in claim 13, wherein each abutting member is provided with either a projection or recess formed at a front end of said abutting member, and said correcting means is provided with the other of the projection or recess engageable with the above projection or recess.

15. An image sensor test apparatus as set forth in any one of claims 1 to 14, wherein a reflecting means reflecting an image is provided on the optical axis of said first image capturing means.

16. A method for testing an image sensor test method bringing input and output terminals of image sensors into contact with contact parts of a test head by contact arms, emitting light on light receiving surfaces of said image sensors from light sources, and inputting and outputting electrical signals with respect to input and output terminals of said image sensors from contact parts of said test head so as to test at least one image sensor for optical characteristics,

said method for testing an image sensor provided with at least
a calculating step of calculating a relative amount of deviation of an optical axis of said image sensor with respect to an optical axis of said light source and

a first correcting step of correcting the position of the contact arm in the state holding said image sensor based on the relative amount of deviation of the optical axis of said image sensor calculated in said calculating step.

17. An image sensor test method as set forth in claim 16, further provided with

a first image capturing step of capturing an image of said image sensor in the state held at said contact arm from said light receiving surface

side and

a first recognizing step of recognizing the relative position of said image sensor in the state held at said contact arm with respect to said contact part based on image information captured in said first image capturing step,

in said first correcting step, the position of said contact arm in the state holding said image sensor is corrected based on the relative amount of deviation of the optical axis of said image sensor calculated in said calculating step and the relative position of said image sensor recognized in said first recognizing step.

18. An image sensor test method as set forth in claim 16 or 17, wherein, in said calculating step, said relative amount of deviation of the optical axis of the image sensor with respect to the optical axis of the light source is calculated based on the electrical signals outputted from the input and output terminals of said image sensor with respect to the contact part of said test head while emitting light from a light source toward a light receiving surface of said image sensor in the state contacting said contact part.

19. An image sensor test method as set forth in claim 17 or 18, wherein, in said first recognizing step, the relative position of said image sensor with respect to said contact part is recognized based on a chip of said image sensor in the image information captured in said first image capturing step.

20. An image sensor test method as set forth in claim 17 or 18, wherein, in said first recognizing step, the relative position of said image sensor with respect to said contact part is recognized based on input and output terminals of said image sensor in the image information captured in said first image capturing step.

21. An image sensor test method as set forth in any one of claims 17 to 20, further provided with

a second imaging step of capturing an image of said contact arm in the state not holding said image sensor,

a third image capturing step of capturing an image of said image sensor in a state not held by said contact arm from the light receiving surface side,

a second recognizing step of recognizing a relative position of said image sensor with respect to said contact arm based on image information captured in said second imaging step and image information captured in said third imaging step, and

a second correcting step of correcting the position of said image sensor in the state not held by said contact arm based on the relative position of said image sensor with respect to said contact arm recognized in said second recognizing step.

22. An image sensor test method as set forth in any one of claims 17 to 21, wherein, in said first recognizing step, the relative position of said image sensor in the state held at said contact arm with respect to said contact part is recognized further based on the image information capturing said contact part.

23. An image sensor test method as set forth in any one of claims 16 to 22, wherein said first correcting step includes a step of correcting a root side contact arm of said contact arm by making it move relative to a holding side contact arm of said contact arm in an X-Y plane substantially parallel to said contact part of the root side contact arm in the free state, then locking said root side contact arm with respect to said holding side contact arm.